Crystal Drawing Simple: Facet Construction and Shading

Original tasks 1, 2 / complete keys

Task 1

In a 6 by 8 cm guide, draw an elongated shard with an upper tip, uneven shoulders, two unequal side points, and a bottom tip. Add a lengthwise axis and two off-center edges to show three visible planes.

Answer: The outline is closed and asymmetrical. A light axis follows the long direction, and two off-center edges divide the visible surface into three unequal panels.

Reason: Two internal edges can partition the visible outline into three panels without connecting every boundary point to one center. Unequal panels support the natural-shard convention.

Check: Count three visible panels. Confirm the outline is closed, the edges follow the long direction, and no edge crosses another.

Task 2

Draw a shard that is 5 cm wide and 9 cm tall. Put the widest left point at y=5 cm and the widest right point at y=4 cm, measured down from the top. Add one long face edge from the upper tip to the right wide point and shade with light from the left.

Answer: The outline is 9 cm tall and 5 cm wide. The left wide point sits 1 cm lower than the right one. The upper-tip-to-right-point edge divides one long panel; shade the left-facing panel lighter and the opposite plane darker.

Reason: The stated y positions make the silhouette asymmetric. The single lengthwise edge creates a visible face boundary without a radial center pattern.

Check: Measure the box, compare the two side-point heights, and confirm the edge reaches the right wide point without crossing the outline.

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Original tasks 3, 4 / complete keys

Task 3

On a 6 by 8 cm guide, mark upper tip U=(3,0), left wide point L=(1,4), right wide point R=(5,4), and bottom tip B=(3,8). Draw the long axis U–B and lengthwise edges U–L, U–R, L–B, and R–B. A student adds a horizontal edge L–R. Identify where it crosses the axis and whether it belongs in the lengthwise construction.

Answer: The edge L–R runs across y=4 from x=1 to x=5, so it crosses U–B at (3,4). It is a transverse line rather than a lengthwise face edge; omit it. Keep the four slanted edges and the long axis to define the visible planes.

Reason: The axis U–B is vertical at x=3. The line L–R is horizontal at y=4, so the two meet at (3,4). Removing L–R leaves the requested lengthwise construction without that crossing.

Check: Plot all four coordinates. Confirm L–R would pass through (3,4); after omitting it, trace U–L, U–R, L–B, R–B, and U–B to ensure none cross except at shared endpoints.

Task 4

Shade a three-plane shard with light from the lower right and add a cast shadow. State which plane is darkest and where the shadow falls.

Answer: Use the lower-right-facing plane as the lightest, the plane turned away as the darkest, and the remaining face as mid-tone. Place the cast shadow generally toward the upper left, opposite the light arrow.

Reason: The tones and shadow follow the stated visual light convention; they do not require a physical lighting calculation.

Check: Compare all three tones with the lower-right arrow and confirm the shadow points generally upper-left without merging into the outline.

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Source rubric / reflection

- [ ] The shard silhouette is elongated, closed, and asymmetrical.
- [ ] Internal boundaries are a small number of lengthwise edges, not a center-radiating cut-gem pattern.
- [ ] Edges remain inside the outline and do not cross.
- [ ] Three tones follow one clearly marked light direction.
- [ ] Shared boundaries are single lines and panels remain distinct.
- [ ] Valid variations in outline and plane size are accepted when the natural-shard reading remains clear.

Reflection: What did you check, what did you change, and what will you try next?